Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

1 - 41. (canceled).

42. (currently amended) A wireless modem apparatus, comprising:

a receiver for frequency down-converting an input signal including,

a first frequency down-conversion module to down-convert the input signal, wherein said first frequency down-conversion module down-converts said input signal according to a first control signal and outputs a first down-converted signal;

a second frequency down-conversion module to down-convert said input signal, wherein said second frequency down-conversion module down-converts said input signal according to a second control signal and outputs a second down-converted signal; and

a subtractor module that subtracts said second down-converted signal from said first down-converted signal and outputs a down-converted signal;

~~The apparatus of claim 41,~~ wherein said second control signal is delayed relative to said first control signal by (.5 + n) cycles of said input signal, wherein n is an integer greater than or equal to 1.

43. (currently amended) A wireless modem apparatus, comprising:

a receiver for frequency down-converting an input signal including,

a first frequency down-conversion module to down-convert the input signal, wherein said first frequency down-conversion module down-converts said input signal according to a first control signal and outputs a first down-converted signal;

a second frequency down-conversion module to down-convert said input signal, wherein said second frequency down-conversion module down-converts said input signal according to a second control signal and outputs a second down-converted signal; and

a subtractor module that subtracts said second down-converted signal from said first down-converted signal and outputs a down-converted signal;

~~The apparatus of claim 41,~~ wherein said first frequency down-conversion module under-samples said input signal according to said first control signal, and said second frequency down-conversion module under-samples said input signal according to said second control signal.

44. (currently amended) A wireless modem apparatus, comprising:

a receiver for frequency down-converting an input signal including,

a first frequency down-conversion module to down-convert the input signal, wherein said first frequency down-conversion module down-converts said input signal according to a first control signal and outputs a first down-converted signal;

a second frequency down-conversion module to down-convert said input signal, wherein said second frequency down-conversion module down-converts said input signal according to a second control signal and outputs a second down-converted signal; and

a subtractor module that subtracts said second down-converted signal from said first down-converted signal and outputs a down-converted signal;

~~The apparatus of claim 41,~~ wherein said first and said second frequency down-conversion modules each comprise a switch and a storage element.

45. (previously presented) The apparatus of claim 44, wherein said storage elements comprises a capacitor that reduces a DC offset voltage in said first down-converted signal and said second down-converted signal.

46. (currently amended) The apparatus of claim 42 [[41]], wherein said subtractor module comprises a differential amplifier.

47. (currently amended) A wireless modem apparatus, comprising:

a receiver for frequency down-converting an input signal including,

a first frequency down-conversion module to down-convert the input signal, wherein said first frequency down-conversion module down-converts said input signal according to a first control signal and outputs a first down-converted signal;

a second frequency down-conversion module to down-convert said input signal, wherein said second frequency down-conversion module down-converts said input signal according to a second control signal and outputs a second down-converted signal;

a subtractor module that subtracts said second down-converted signal from said first down-converted signal and outputs a down-converted signal;

~~The apparatus of claim 41, further comprising:~~

a [balanced] transmitter for up-converting a baseband signal and coupled to said [balanced] receiver, including,

an inverter, to receive said baseband signal and generate an inverted baseband signal;

a first controlled switch, coupled to a non-inverting output of said inverter, said first controlled switch to sample said baseband signal according to a third control signal, resulting in a first harmonically rich signal;

a second controlled switch, coupled to an inverting output of said inverter, said second controlled switch to sample said inverted baseband signal according to a fourth control signal, resulting in a second harmonically rich signal; and

a combiner, coupled to an output of said first controlled switch and an output of said second controlled switch, said combiner to combine said first harmonically rich signal and said second harmonically rich signal, resulting in a third harmonically rich signal.

48. (previously presented) The apparatus of claim 47, wherein said fourth control signal is phase shifted with respect to said third control signal.

49. (previously presented) The apparatus of claim 47, wherein said fourth control signal is phase shifted by 180 degrees with respect to said third control signal.

50. (previously presented) The apparatus of claim 47, further comprising a filter coupled to an output of said combiner, wherein said filter outputs a desired harmonic from said third harmonically rich signal.

51. (previously presented) The apparatus of claim 47, wherein said apparatus is an infrastructure device.

52. (previously presented) The apparatus of claim 47, wherein said apparatus is a client device.

53. (currently amended) The apparatus of claim 47, wherein said ~~third~~ first controlled switch shunts said baseband signal to a reference potential according to said ~~first~~ third control signal, and wherein said ~~fourth~~ second controlled switch shunts said inverted baseband signal to said reference potential according to said ~~second~~ fourth control signal.

54. (previously presented) The apparatus of claim 47, further comprising an antenna coupled to said balanced transmitter and said balanced receiver.

55. (previously presented) The apparatus of claim 54, further comprising a switch, said switch selectively connecting said transmitter or said receiver to said antenna.

56. (previously presented) The apparatus of claim 47, further comprising a baseband processor coupled to said transmitter and said receiver.

57. (previously presented) The apparatus of claim 47, further comprising a media access controller (MAC) coupled to said transmitter and said receiver.

58. (previously presented) The apparatus of claim 57, wherein said MAC comprises a means for controlling accessing to a WLAN medium.

59. (previously presented) The apparatus of claim 58, wherein said means for controlling includes carrier sense multiple access with collision avoidance (CSMA/CA).

60. (previously presented) The apparatus of claim 47, further comprising a demodulator/modulator facilitation module coupled to said transmitter and receiver.

61. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for modulating said baseband signal using differential binary phase shift keying (DBPSK).

62. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for de-modulating said down-converted signal using differential binary phase shift keying (DBPSK).

63. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for spreading said baseband signal.

64. (previously presented) The apparatus of claim 63, wherein said means for spreading comprises a means for spreading said baseband signal using a Barker code.

65. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for de-spreading said down-converted signal.

66. (previously presented) The apparatus of claim 65, wherein said means for de-spreading comprises a means for de-spreading said down-converted signal using a Barker code.

67. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for modulating said baseband signal using Gaussian phase shift keying (GFSK).

68. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for de-modulating said down converted signal using Gaussian phase shift keying (GFSK).

69. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for modulating said baseband signal using Orthogonal Frequency Division Multiplexing (OFDM).

70. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for de-modulating said down converted signal using Orthogonal Frequency Division Multiplexing (OFDM).

71. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for modulating said baseband signal using Complimentary Code Keying (CCK).

72. (previously presented) The apparatus of claim 60, wherein said demodulator/modulator facilitation module comprises a means for de-modulating said down converted signal using Complimentary Code Keying (CCK).

73. (withdrawn) A method of receiving a wireless LAN signal, comprising:

(1) splitting the wireless LAN signal into I and Q components;

(2) down-converting said I signal component and said Q signal component;

(3) de-spreading said down-converted I and Q signals using a spreading code;

(4) differentially demodulating information encoded in said I and Q signals;

(5) sending said demodulated information in said I and Q signals to a Media Access Controller (MAC) Interface wherein said I and Q signals are de-scrambled and combined to a single output signal.

74. (withdrawn) The method of claim 73, wherein separate spreading codes are used for the I and Q signal components in step (3).

75. (withdrawn) The method of claim 73, wherein step (4) comprises using Binary Phase Shift Keying (BPSK) to demodulate said I and Q signals.

76. (withdrawn) The method of claim 73, wherein step (4) comprises using Quadrature Phase Shift Keying (QPSK) to demodulate said I and Q signals.

77. (previously presented) In a wireless LAN device, a method of down-converting a received RF signal, comprising:

down-converting said received RF signal according to a first control signal and a second control signal, resulting in a down-converted signal, wherein said second control signal is delayed relative to said first control signal by (.5 + n) cycles of said received RF signal, wherein n is an integer greater than or equal to 1;

de-spreading said down-converted signal using a spreading code, resulting in a de-spread signal; and

de-modulating said de-spread signal, resulting in a de-modulated signal.